The value of group model building: a stakeholder perspective

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Abstract: Stakeholder group model-building (GMB) is often used as an
approach to form a model in system dynamics (SD) and increasingly also to
support strategic decisions in organisations. In this study, grounded theory
approach is used to study how eight participants in GMB experienced
the process and to increase understanding of the value of the method. A number
of strategies were coded and analysed and a theoretical model was developed
describing: 1) the causal conditions that underlay the development of value
adding strategies; 2) phenomena that arose from these causal conditions; 3) the
context that influenced strategy development; 4) intervening conditions that
influenced strategy development; 5) value adding strategies; 6) the
consequences of these strategies. Subcategories of each component were
identified and are illustrated and implications for GMB projects are addressed.
A discussion section is presented based on the results and the author’s
experience of stakeholder GMB workshops.
Keywords: system dynamics; SD; methodology; group model building; grounded theory; stakeholder.


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1 Introduction

The research objectives of this study were both to explore stakeholder group model-building (GMB) and the experiences participants in GMB have and to increase understanding of the value of the method by constructing a theoretical model with the grounded theory approach (GTA). The motivation for this research arose when the authors of this paper were conducting and managing a series of GMB workshops in order to establish a system dynamics (SD) model of a complex project (see Olafsdottir et al., in press).

The SD model building process in which a stakeholder group is deeply involved in the process of model construction is here referred to as the GMB process. It is a collaborative modelling of causal relations and feedback loops, with the aim of understanding the relations among system variables in a complex system (Hoppenbrouwers and Rouwette, 2012). SD is a suitable modelling methodology when the analysed problem has wide temporal boundaries, focusing on the behaviour patterns that isolated events lead to (Forrester, 1961; Sterman, 2000). The method has been used in all kinds of projects, even large-scale collaborative modelling of critical infrastructure.
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protection projects as Hernantes et al. (2012) describe in a case study, to analyse energy usage for automotive manufacturing (Adane and Nicolescu, 2014) or to research quality in manufacturing (Gunasekaran et al., 2002), to name a few. Zwikael et al. (2012) underscore the importance of collaboration, engagement with stakeholders and stakeholder management in virtual projects, but it is equally important for non-virtual projects and crucial for project success.

A stakeholder is someone who will develop, make use of or have an impact on any aspect of a project. Grimble and Wellard (1997) describe stakeholders in a number of ways, including defining them according to their importance and influence, which in turn leads to a classification of primary and secondary stakeholders. With a group of stakeholders the relationships between them also need some attention. In a paper Missonier and Loufrani-Fedida (2014) some light is shed on the dynamic and emergent nature of stakeholder relationships. They demonstrate how the nature, roles, and relations between stakeholders co-evolve with the project’s definition (Missonier and Loufrani-Fedida, 2014).

Andersen et al. (2007) point out that there are at least six other distinct approaches to client participation that can be identified in addition to GMB and other problem structuring methods (PSMs) linked to soft operations research (OR):

1. the reference group approach (Stenberg, 1980)
2. the strategic forum (Richmond, 1997)
3. the stepwise approach (Wolstenholme, 1992)
4. modelling as learning (Lane, 1992)
5. strategy dynamics (Warren, 2005)

The GMB method emerged as a guide to the modelling process, where an attempt is made to merge the conceptual part of the modelling process (the qualitative process) and the quantitative simulation with SD tools (Vennix, 1996). It has been clear from the beginning within SD research that models are of limited use if they cannot communicate understanding to the user. The development of the causal loop diagram (CLD) concept was an attempt by Forrester to address this issue (Forrester, 1961). It was later realised that the conceptual phase of the modelling progress was important when dealing with problems, together with stakeholders (Randers, 1980).

In many cases the stakeholders have different fundamental ideas about the problem at hand. They may have a different idea about what constitutes quality for the concept or approach being modelled, as Mahapatra and Khan (2007) point out in the case for the Technical Education System, or even the whole system that is being modelled. Scott et al. (2013) performed a qualitative study where they examined whether or not the changes caused by participation in GMB caused by mental model refinement and alignment tended to be enduring. The results suggested that participants’ views on the workshop topic changed and became more alike through the workshop process, and the changes were enduring even in the relative absence of reinforcing activities (Scott et al., 2013). Numerous studies can be found that demonstrate that one of the reasons for using stakeholder GMB is to gain their ownership of and consensus about the model in the hope that the stakeholders will be supportive of the model, defend it against criticism and
employ the results in the industry (Akkermans and Vennix, 1997). There is a growing body of literature on how to involve clients in the modelling process and it is a general assumption among those who agree upon using GMB that SD can be used as a method to systematically elicit and share mental models in teams (Vennix, 1996). When following that approach the process of building a model starts from the different perceptions of the participants. Stated differently, GMB is a process in which team members exchange their perceptions of a problem and explore such questions as:

- What exactly is the problem we face?
- How did the problematic situation originate?
- What might be its underlying causes?
- How can the problem be effectively tackled?

The primary focus is descriptive and diagnostic; the way team members think a system works is separated from the question of how they would like a system to work (Vennix, 1996). But when trying to establish whether GMB is successful it is imperative to define the meaning of successful. One definition is “to obtain something desirable or intended”, and that is the meaning used in this research. Therefore, a successful GMB project, as used in this research, is when the intended goals for the GMB are reached or exceeded and the process returns value for both stakeholders and the workshop managers.

Managing a GMB project is challenging and there is more than one way to see to it. The best and most promising practices for GMB can be found in ‘Scriptapedia’, which is a collaborative effort to make group model building in SD more transparent, accessible, and shared around the world (Hovmand et al., 2013). But even though goals can be different for different projects and the structure of the GMB can be different, the aims are usually the same. According to Vennix (1996), there are three purposes with regard to GMB: firstly to create a climate in which team learning can take place, reinforcing understanding of the problem; secondly to foster consensus (not compromise); and thirdly to create acceptance of and commitment to the decisions made. But what is the value of the GMB process? ‘Value’ here refers to “usefulness or importance” (Merriam-Webster.com, 2014) from both the stakeholders’ and the researchers’ point of view. Do the participants in GMB projects have the same expectations and the same goals as the GMB managers? Monat (2007) observed a positive correlation, indicating that employee goal-behaviour-metric-reward (GBMR) systems correlate with corporate productivity. Would a similar system work with GMB participants? To gain a better understanding of the value of the method and of the experiences participants in GMB have a theoretical model with the GTA is presented in this paper.

2 Methodology

The methodology is based on the GTA (Glaser and Strauss, 1967), a qualitative research method designed to aid in the systematic collection and analysis of data and the construction of a theoretical model. The method is believed to produce a plausible and coherent explanation of the phenomenon under study with a small sample. Instead of trying to extract and quantify abstract categories from social phenomena, as quantitative scholars do, qualitative researchers try to understand social processes in context
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(Esterberg, 2002). Although the results from a qualitative study such as this one are not statistically generalisable, the theory generated may lead to quantifiable research; hence the aim of the GTA is to generate or discover a theory. It may be defined as “the discovery of theory from data systematically obtained from social research” (Glaser and Strauss, 1967). The method is ideal for exploring integral social relationships and the behaviour of groups where there has been little exploration of the contextual factors that affect individual lives (Crooks, 2001). The approach consists of a set of steps whose careful execution is thought to guarantee a good theory as the outcome (Borgatti, 2006; Strauss and Corbin, 1998). According to Strauss and Corbin (1998), the quality of a theory can be evaluated by the process by which a theory is constructed. The basic idea of the GTA approach is to read and re-read a textual database and discovers or label variables, called categories, concepts and properties, and their interrelationships (Borgatti, 2006). The researcher is constantly gathering more data with constant comparison, analysing it, comparing the analyses to past analyses and then gathering and analysing more data in order to clarify an emerging theoretical relationship among variables. This leads to concepts and preliminary theoretical ideas that emerge out of data and which the prompt further analysis. This concurrent process is known as the constant comparative method of analysis (Glaser and Strauss, 1967) and is central to GTA. During the course of the analysis, working hypotheses are generated. The investigation of these working hypotheses will require the gathering of new data. The result is the identification of a basic social process and the generation of an explanatory theory. The working hypotheses are not presented in the paper as they are used to direct the gathering of new data or to reanalyse old data and therefore change and develop throughout the process.

2.1 Collection of data

All the interviews were semi-structured, i.e., the researcher had a list of questions on fairly specific topics to be covered, often referred to as an interview guide, but the interviewee has a great deal of leeway in how to reply. Questions did not follow exactly the path outlined on the schedule. Questions that are not included in the guide were also asked as the researcher picked up on things said by interviewees. But, by and large, all of the questions were asked and with a similar wording. Hence an interview framework, with the following core themes for the interview guide was used:

1. general
2. GMB
3. CLD
4. motivation
5. trust
6. problem approach
7. other.
The interviews took place over two time periods. The first period was between 18th of September 2012–19th of November 2012, and the second from 18th of February 2014–6th of March 2014. The interviews took place in Malmö (Sweden), Reykjavík (Iceland) and over phone via the internet. All the interviewees were asked about their background in general and in relation to SD and GMB, and to describe their current connection, if any, to GMB and/or SD. They were also asked about their opinion regarding the usefulness of GMB, their experience with GMB and their trust in models in general. In particular, the interviewees were asked how satisfied they were with the final model as a participant in a workshop representing a stakeholder group or as a workshop manager. All the interviews were audio recorded and transcribed.

2.2 Data analysis

The data analysis was based on transcriptions of semi-structured, in-depth interviews and field notes from a series of GMB sessions. Following are the stages introduced by Strauss and Corbin used in the analysis:

1. **Codes:** Anchors identified in the data that serve as key points for gathering the data.

2. **Concepts:** Codes of similar content collected together that allow the data to be grouped.

3. **Categories:** Broad groups of similar concepts identified and used to generate a theory.

4. **Theories:** A collection of explanations that explain the subject of the research.

The data gathered from the interviews were analysed with constant comparison and line-by-line open coding, i.e., the analytic process through which concepts are identified and their properties and dimensions are discovered within the data. Open coding was followed by axial coding. Axial coding puts the data back together in new ways by making connections between a category and its subcategories (Strauss and Corbin, 1998). Axial coding was followed by selective coding, i.e., the integrative process of selecting the core category and systematically relating it to other categories. Analytical memos were written in the stage between coding and writing an integration of categories into a theoretical framework. To maintain anonymity the interviewees were identified with letters. The research method was mainly based on the fact that the data were gathered and hypotheses formed based on the data which would ideally be a foundation for a theory. Emphasis was placed on finding clues in the data that can possibly increase the researcher’s understanding of the subject. The clues can contribute to the researcher’s point of view and possibly broaden the scope of the question addressed. This approach fit well with the research goal, i.e., to increase knowledge and deepen understanding of the real values on forming a CLD with the stakeholder GMB method.

2.3 Participants

Eight carefully chosen individuals, six men and two women, between the ages of 35–65 years, participated in the research. Participants were chosen in consultation with a
highly qualified professor in SD with many years of experience in the field. All the participants had had some experience using GMB in relation to forming a CLD intended to be the basis for an SD model. Two of the participants qualified as specialists in SD and their experience was mostly characterised by managing workshops. The other participants were not specialists in SD but had had experience as participants in workshops. Their point of view was considered particularly valuable for this research. The first two had a comprehensive academic career but those that were not considered SD specialists had very different backgrounds. An effort was made to choose participants that were unknown to the researcher. The participant’s identities are shown in Table 1.

<table>
<thead>
<tr>
<th>ID</th>
<th>Status</th>
</tr>
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<tbody>
<tr>
<td>P</td>
<td>University professor currently working in the field of SD. Background in engineering and environmental science. PhD degree. Specialist in SD.</td>
</tr>
<tr>
<td>SB</td>
<td>University professor currently working in the field of SD. Background in chemical engineering, environmental science, medicine and mathematics. PhD degree. Specialist in SD.</td>
</tr>
<tr>
<td>GB</td>
<td>Hotel manager, entrepreneur, writer, business, self-employed. Student.</td>
</tr>
<tr>
<td>KEF</td>
<td>Computer science, modelling. MSc degree.</td>
</tr>
<tr>
<td>JL</td>
<td>Banking. Modeller for money systems. Master’s degree, system analysis.</td>
</tr>
<tr>
<td>AH</td>
<td>Small restaurant owner. Teacher. Master’s degree.</td>
</tr>
<tr>
<td>MF</td>
<td>Experience in charities and social enterprises for public and private sector. Degree in geography.</td>
</tr>
<tr>
<td>PO</td>
<td>Works with nature related issues. BS degree in forestry.</td>
</tr>
</tbody>
</table>

### 3 Results

The grounded theory model for the value was evolved from Strauss and Corbin’s basic framework of generic relationships and from that the proposed categories to include in the model are related to

1. the phenomenon under study
2. the conditions related to that phenomenon
3. the actions and strategies directed at managing or handling the phenomenon
4. the consequences of the actions related to the phenomenon (Corbin and Strauss, 1990).

The framework is presented in Figure 1. Quotes are presented to support the results.
3.1 Causal conditions of phenomena related to the experienced value of GMB

Two types of causal conditions emerged from the data, which ultimately led to certain phenomenological experiences related to the experienced value from GMB. These causal conditions were:

a. based on stakeholder conflicts
b. based on the information gap.

When based on stakeholder conflicts, the stakeholders are driven to participate so their voice can be heard and to be a part of a solution they like. From the project manager’s point of view a less controversial solution is likely to emerge when the modelling work is in collaboration with those who have conflicts regarding the subject. When based on an information gap, the stakeholders participate to gain a better understanding of the system, out of curiosity or to gain an understanding of the methodology. Also for those managing the project, one interviewee mentioned that one reason for choosing GMB was to gain an understanding of things that are outside academia since these things tend to be less documented and, as he said, “Then you have to have input of information” [SB].

3.2 Phenomena resulting from the causal conditions

Causal conditions, conflicts and information gaps resulted in two core categories of subjective phenomena:

a. confusion
b. uncertainty regarding the results.

Some stakeholders felt confused about the aim and goals of the project. Some also felt that complicated CLDs introduced in the workshops only added a layer of confusion among participants and even thought that it did more harm than good. Based on the interviews, it seemed more as a rule than an exception that the participants appeared to be uncertain about what the results from the GMB they took part in actually were. One participant had the following to say: “But it would have been great to be, you know, kept informed and to be, for the original participants, to be aware of what the outcomes were” [JL].
3.3 Context in which value adding strategies developed

Value adding strategies were developed in response to conflicts among stakeholder participants and to confusion among stakeholders regarding the results. These strategies were influenced by particular contextual markers related to both causal conditions. These contextual markers included both

a. group atmosphere
b. state of mind.

The phenomena, confusion and uncertainty regarding the results varied as to the group atmosphere in the workshops. The codes that emerged from the data reflecting group atmosphere are listed in Table 2:

<table>
<thead>
<tr>
<th>Group atmosphere</th>
</tr>
</thead>
<tbody>
<tr>
<td>The chemistry in the group usually changes throughout the GMBs lifespan and can often be categorised into several different stages based on that chemistry</td>
</tr>
<tr>
<td>Uncertainty at first</td>
</tr>
<tr>
<td>Group chemistry suppressive at first</td>
</tr>
<tr>
<td>Participants usually have strong opinions about the subject</td>
</tr>
<tr>
<td>Participants need to fight (race) to get their opinions recognised in the system</td>
</tr>
<tr>
<td>Lack of tolerance for different opinions</td>
</tr>
</tbody>
</table>

Without a doubt, positive group chemistry is one of the key things leading to a successful GMB. Often the group of stakeholders is a mixture of very different individuals with different opinions on the subject and in some cases there might be disputes between participants. The data indicated that the participants usually had very strong opinions regarding the subject matter and there could be a lack of tolerance towards different opinions.

In order for any productive work to be possible it is important that the participants get to know each other and therefore reinforce cognitive discussions. One of the SD specialists, SB, expressed his experience of the atmosphere in workshops as it was always completely unknown in the beginning but underlined the importance of the workshop manager’s having a sense of the chemistry going on in the group. The participants also agreed that they felt different stages of tension in the atmosphere in the GMB sessions. Emphasis was therefore placed on the importance that the GMB leader spotting the chemistry in the group and handling it in a way that it provided a productive and positive effect on the GMB.

The phenomena, confusion and uncertainty regarding the results varied as to the state of mind of the stakeholders. The codes are summarised and substantiated in Table 3:

<table>
<thead>
<tr>
<th>Participants state of mind towards group work and model building</th>
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<tbody>
<tr>
<td>Positive attitude towards model building in general</td>
</tr>
<tr>
<td>Negative attitude towards model building in general</td>
</tr>
<tr>
<td>Educated/work experience in group dynamics</td>
</tr>
<tr>
<td>Positive attitude towards stakeholder group model building as an approach</td>
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Certainly a participant’s state of mind influences the confusion and uncertainty experienced. Most of the participants were positive towards model building in general, but surprisingly not all. The same goes for group work, i.e., most of the participants were positive towards group work and their attitude is mostly echoed in this supporting quote: “I have a great belief in group work in general mixed with individual work.” [KEF]

3.4 Intervening conditions influencing value adding strategies

In addition to context, there were also intervening conditions, which were broad, general conditions that influenced the value adding strategies. Intervening conditions included

a what motivated the stakeholders to participate
b passion to invest time in the project.

The codes that emerged reflecting a participant’s motivation to participate are presented and substantiated in Table 4.

<table>
<thead>
<tr>
<th>Table 4 Motivation</th>
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<tbody>
<tr>
<td>Participation motivation originates from preserving interest in some group</td>
</tr>
<tr>
<td>To leave something behind</td>
</tr>
<tr>
<td>Motivation would be greater with assurance regarding the use of the outcome</td>
</tr>
<tr>
<td>Feel like they have useful information (feeling of importance)</td>
</tr>
<tr>
<td>The willingness to network</td>
</tr>
<tr>
<td>Participants participate cause it is ‘their’ problem (interest in the project)</td>
</tr>
</tbody>
</table>

The motivation for participants to take time for a GMB project is not always clear. Among those interviewed, two sides came up. First, the interviewees representing participants in GMB seemed to experience themselves as representatives of some group of stakeholders and felt as though it was some sort of social responsibility to represent the group they identified themselves with. Most participants did have some personal reasons as well, though some seemed to just want to use the opportunity to express their opinions in a group of people. One participant even saw this as an opportunity to have some kind of legacy; “You need to think about what you leave behind; we are not immortal” [GB]. Most agreed that they would have been ready to put more effort into the project if they had believed that the project would have had any effect after the model was ready.

3.5 Value adding strategies for GMB

In the presence of the context and intervening conditions described above, two overarching phenomena led to the development of two parallel core value adding strategies

a keeping things simple
b investing time in introducing the results to the stakeholders.

The strategies within each core category are illustrated in Figure 2.
Keep things simple. When every stakeholder’s point of view is considered, systems tend to get really complicated fast. For stakeholders that are not used to SD, complicated CLDs may seem overwhelming. Some participants seemed concerned about the complexity level of CLDs presented at the workshops they attended, both in relation to their own understanding and the fear that others would misunderstand the system. The strategy used by a participant with experience in managing GMB sessions to keep the stakeholders involved in the process the whole time was to actively keep the level of communication quite simple in order to increase understanding and to avoid presenting complicated CLDs in workshops with non-SD specialists.

Invest time in introducing the results to the stakeholders. One of the threads throughout the interviews was that participants seemed to lack knowledge about the outcome of the project they participated in, resulting in a lack of trust towards the process and its usefulness. The strategy that the stakeholders asked for was to get a formal presentation of the final results. The interviews indicated that some participants were confused about the final results and even the results from the workshop they attended and it seemed that since they felt insecure regarding their own understanding of the project they acted as if they agreed fully with the results presented in the workshops. Those who had received a report with results without a formal presentation in most cases had not read through the report but would be interested in getting a presentation. Formal presentation for those that participated in the GMB should help to ensure that the participants understand and feel consensus regarding the outcome.

3.6 Consequences of value adding strategies

The consequences of the strategies used by GMB managers were grouped into the subthemes (concepts), i.e., usefulness, importance, consensus, trust, satisfaction, learning and ownership, that emerged from the data. Those concepts are summarised with codes and comments demonstrated in Figure 3.
Usefulness. For something to be of value it needs to be useful in some sense. The product formed in the GMB process is a model, and therefore one could assume that for GMB to be valuable the model needs to be useful. The stakeholders’ opinions regarding the usefulness of models varied. One interviewee had the following to say: “I think that models are pointless, unless they are used” [GB]. On the other hand MF believed that a model could help in most situations even though it would never be completed. In such cases he felt that it would at least help people to look at something strategically. The outcome from a GMB workshop could therefore be useful even though the model would not be finished. Surprisingly, some stakeholders seemed sceptical about the results from the workshops even though they had never expressed this doubt to the GMB managers. JL felt that the outcome was lacking a lot of variables. In his opinion there were layers of complexity that made the whole process impossible to get any useful outcomes from. He also felt that GMB managers might want to think more about the payoff for the stakeholders, underscoring his opinion that information regarding how the model could be used by the stakeholders in the future had been lacking in the project he participated in.

Importance. The feeling of importance or having significant knowledge that might be of use for the project being studied in the GMB was a common factor among the participants. One participant said the following: “I think my knowledge was quite helpful sometimes because I was involved in things” [MF] and others reflected that opinion as well.

Participants representing stakeholder groups that did not have much power to act regarding the subject analysed appreciated their involvement a great deal and shared a feeling of importance by participating. Hence, they might therefore serve as influential
supporters of the final outcome. AH participated in a huge GMB project. She represented just a small company and said it was very nice to be able to feel that her voice was being heard, even though she only was involved in a small business operation.

Consensus. The interviewees categorised as specialists agreed that the success of a GMB session could be measured by whether there is consensus about the recommendations and the final model. None was willing to admit that they had managed a GMB project that did not reach consensus in the end. On the other hand, the stakeholders interviewed mostly just seemed to partly agree upon the final model and recommendations from the GMB sessions. Most of them were content and satisfied, but felt that some things should be different.

Trust. Participants valued trust in the process. SB even thought it was one of the cornerstones in GMB. It was also evident that the stakeholders preferred models that were made with stakeholder GMB as opposed to models built without. However, it did seem as if some of the participants lacked complete trust in the outcome. Some interviewees, for example JL, said that even though he was happy about the process overall there were all sorts of parameters that he thought should have been included but were not.

Satisfaction/dissatisfaction. When it comes to level of satisfaction the following stood out. First, it seemed that in general most of the participants were satisfied overall with the results of the GMB sessions and especially with the work done and the networking gained from the GMB sessions. Most expressed in some way that they felt it had enabled exploration of different understandings and incorporation of different knowledge bases. Secondly, several of the participants expressed dissatisfaction concerning lack of understanding and even lack of presentation of the final results. One participant described how he was afraid that the other participants might not understand the outcome. As he said, “I’m not sure that everyone had a full understanding about what the project was about in the end” [KEF]. Another participant, MF, mentioned that he really thought that the project would just end up as a sort of academic exercise and JL had something similar in mind. And last but not least, the aspect of networking the GMB was highly appreciated by the stakeholders.

Learning. One of the things that the stakeholders valued the most was learning about system thinking, gaining new knowledge about the project they were researching, and some valued the experience of working in a group. Most of those interviewed thought that they had learned something from the experience, whether it concerned SD or the project being researched each time. One participant said the following: “I understand more about models than I did before I attended the workshop. … More confident in use of models as well” [AH].

Ownership. The specialists interviewed agreed that if GMB were to be a success the stakeholders would have to gain ownership of the model. One said: “With group model building you make them own the problem. It becomes theirs in common” [SB]. Both P and SB made a similar point about ownership, i.e., they felt that when ownership of the model is gained from the stakeholders they are ready to defend the model when it is criticised. SB also pointed out that it can be particularly beneficial when participants with lower social status feel ownership of the model for the reason that people in that category are more likely to defend the model against criticism as they suddenly have equal status with people with a higher social/academic background. The stakeholder participants interviewed agreed that they experienced some sort of ownership feeling in the final
4 Conclusions

The purpose of the study was to explore GMB and the experiences participants in GMB have and to increase understanding of the value of the method. A theoretical model of the value of GMB was evolved from Corbin’s and Strauss’ framework of generic relationships (Corbin and Strauss, 1990). It is established from a set of value adding strategies: “keep things simple and invest time in introducing the results to the stakeholders”. The consequences lead to a value framework consisting of seven concepts, i.e., usefulness, importance, consensus, trust, satisfaction, learning and ownership.

The research indicated that value occurred not only in the form of ownership and trust in the model but that there was also a great value for the stakeholders to expand their social network and that this was one of the key motivations for participants to get involved with GMB. The stakeholders interviewed seemed to care less about the final results than expected and some were even sceptical about the results. Even though the stakeholders were not in complete agreement regarding the final outcome they were satisfied with the GMB experience. One participant commented that the GMB experience assisted in a better understanding of the model development process and it had enabled them to explore different understandings of the system and incorporate different knowledge bases. In most cases it seemed as though this was even more important for the stakeholders than the outcome itself. The participants also found that the approach allowed a holistic view of the system, agreeing with the SD specialists, but there was uncertainty whether there was shared understanding of the system in the end and whether the final outcome assisted participants to understand the inherent complexities. The stakeholders interviewed all had in common that they were willing to donate their time to GMB projects. They also shared the feeling of being socially responsible and they had a positive attitude towards stakeholder GMB as an approach, though some were sceptical about model building in general. Most of the interviewees made a comment about how they experienced the changes in the atmosphere throughout the GMB lifespan and they had a similar description of their experience that suggested a suppressive chemistry at first that changed towards more effective and productive chemistry in the end. This shift in group atmosphere could also indicate that team learning was reached; in accordance with Phillips, the goals of GMB are to accomplish an enhanced team learning in such a way that it creates shared social reality (Phillips, 1989). Some of the participants noted that they felt as if the stakeholders participating in the project had strong opinions about the relevant subject, resulting in a lack of tolerance towards different opinions and some frustration, especially in the beginning.

Group model building is increasingly used to support strategic decisions in organisations and it can add to the organisational competitiveness if done well. The primary purpose of this study was to contribute to the understanding of GMB. Consequently, the main theoretical contribution sheds light on the relevance and the value of the method. The empirical evidence of the study has value in itself, since empirical investigations in the field are still rather scarce. Demonstrating the usefulness of this conceptual approach as a method for decision makers to evaluate the value of using GMB is considered one of the main managerial implications of this research. The
authors hope that the empirical results of this research will increase understanding of the complex nature of GMB. The findings can be used to tailor workshops accordingly by managers and educators. This study has also contributed to the literature by providing insight into GMB and on how stakeholders experience the process.

Recommendations for future research include emphasis on the payoff for the involved stakeholders and their motivation to participate in GMB. It would also be interesting to see whether a GBMR system for the GMB work, similar to what Monte researched for corporate productivity, would have a positive or negative correlation with the GMB outcome (Monat, 2007). Another interesting aspect to research would be a comparison of stakeholders’ take on a GMB outcome.

All research studies have limitations and this study is no exception. Firstly, beyond the theoretical and managerial contributions of the results, the research has a methodological limitation regarding the external validity of the mentioned results and, thus, their scope. According to many social scientists the main shortcomings of the GTA is the oversimplified deductive approach to theory development that has been adopted in scientific methods. This occurs because some of the essential variables of reality are assumed to be constants (Lye et al., 2006). One key limitation especially for this research is that interviews were conducted in two languages, Icelandic and English, and hence the data analysis as well as the data was conducted partially through translation and can therefore be considered a possible shortcoming.

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References


